

Amendments to the Specification:

On page 1, after the title and before line 1, please insert the heading:

Background

On page 2, before the paragraph beginning on line 21, please insert the heading:

Summary

On page 2, please amend the paragraph spanning lines 26-31 as follows:

In order to achieve this object a magnetic resonance imaging apparatus and a magnetic resonance imaging method ~~according to the present invention~~ are characterized in that at least two RF coils are combined for reception of RF signals of said RF coils with a single receiver channel, wherein said at least two RF coils are selected so as to provide maximum spatially varying coil sensitivities along the principal axis for coil sensitivity encoding.

Please amend the paragraph beginning on page 2, line 32 and continuing to page 3, line 10 as follows:

~~The present invention is based on the idea of selecting the~~ combination of RF signals from RF coils is selected by using the knowledge of the preferred orientation of scanning and/or SENSE reduction direction. The SENSE method uses the spatial distinctness of the coil sensitivity profiles to encode for spatial information. Data from several points in space will coincide in the under-encoded image. To facilitate SENSE unfolding the sensitivities at the points to which the data has to be unfolded should be as distinct as possible. This is best achieved when the individual RF coils or coil-combinations probe the examination object, e.g. a patient or a part of a patient, in a way that is as different as possible. Preferably, a fixed combination is

selected to downscale the number of RF coils M to the number of receiver channels N based upon insights regarding anatomy and preferred imaging planes/orientations and related foldover/SENSE folding directions; i.e. a combination is preferably selected in dependence on the preferred coil sensitivity encoding axis for the majority of examinations to be performed with the RF coil system.

On page 3, please amend the paragraph spanning lines 18-30 as follows:

A particular embodiment of a magnetic resonance imaging apparatus according to the invention is characterized in that the RF coil system comprises 8 RF coils and the MRI apparatus comprises 6 receiver channels, wherein two pairs of two RF coils are each combined with two receiver channels, while the four remaining RF coils are connected to the four remaining receiver channels. Such an RF coil system is preferably applied for scanning the head of a patient, the 8 RF coils being preferably arranged around the head in the form of a bird cage. Another application is cardiac imaging where two rings of four RF coils are each arranged around the body of a patient. Advantageous embodiments of such MRI apparatuses and, in particular, advantageous combinations of RF coils for such applications are defined in claims 3 to 10 and will be explained in more detail with reference to the Figures below. However, the invention is not restricted to these particular embodiments but can be applied to any other MRI apparatus comprising more RF coils than receiver channels.

On page 3, after the paragraph ending on line 30, please insert the following paragraph, heading, and paragraph:

Advantages of the present application will be apparent to those of ordinary skill in the art upon reading and understanding the following detailed description.

Brief Description of the Drawings

The invention may take form in various components and arrangements of components, and in various steps and arrangements of steps. The drawings are only

for purposes of illustrating the preferred embodiments and are not to be construed as limiting the invention.

On page 3, please delete the paragraph spanning lines 31-32 in its entirety.

On page 4, before the paragraph beginning on line 13, please insert the heading:

Detailed Description

On page 5, please amend the paragraph spanning lines 8-19 as follows:

The RF coil system shown in Fig. 2 is not optimal for the SENSE method since points in space that have to be unfolded when applying the SENSE reduction are encoded in a single receiver channel that does not sufficiently adequately show different complex coil sensitivity patterns to enable unfolding. It is therefore proposed, according to the present invention, to combine the RF signals from RF coils in such a way that maximum spatially varying coil sensitivities are provided along the principle axes for coil sensitivity encoding. This means that, ~~according to the invention,~~ a fixed combination of RF signals from RF coils is chosen according to the insight into or knowledge of the preferred main orientation of scanning and SENSE reduction direction in the anatomy of primary interest. As much individuality as possible should be provided along the preferred or actual SENSE reduction direction. Particular Exemplary embodiments of such combinations are schematically illustrated in Figs. 3 to 6.

On page 5, please amend the paragraph spanning lines 20-24 as follows:

The embodiments are discussed using the anatomy of the brain. Here, at least in cylindrical systems, the majority of scans employ a foldover direction LR (approximately 70%), followed by AP (approximately 20%, especially EPI). Given

the strong preference for certain directions, a "hard-wired" choice can be made for combining 4 out of 8 coils into 2 channels. ~~This is the gist of the invention.~~

On page 7, after the last paragraph ending on line 12, please insert the following new paragraph:

The invention has been described with reference to the preferred embodiments. Modifications and alterations may occur to others upon reading and understanding the preceding detailed description. It is intended that the invention be constructed as including all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.